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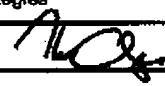
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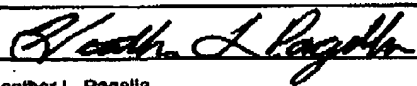
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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	10/018,319
	Filing Date	04/25/2002
	First Named Inventor	Manfred Stefener
	Art Unit	1745
	Examiner Name	Crepeau, Jonathan
	Attorney Docket Number	GRUNP17
Total Number of Pages in This Submission		32

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<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application No.	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
10/018,319	04/25/2002	Manfred Stefener	GRUNP17	1648

Invention	Examiner	Art Unit
Fuel Cell System and Fuel Cell Therefor	Crepeau, Jonathan	1746

APPEAL BRIEF

Mail Stop TTAB
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from an Office action dated July 10, 2006.

The real party in interest is named on page 2;

Related appeals and interferences are listed on page 3;

Status of the claims is listed on page 4;

Status of amendments is listed on page 5;

Summary of claimed subject matter is presented on page 6;

Grounds of rejection to be reviewed on appeal are presented on page 7;

Arguments begin on page 8;

Claims are listed in Appendix A, beginning on page 27;

Evidence is presented in Appendix B, beginning on page 30;

Related proceedings are listed in Appendix C, beginning on page 31.

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REAL PARTY IN INTEREST

The present application has been assigned to SFC Smart Fuel Cell AG, of Eugen-Sänger-Strasse, Geb. 53.0, 85649 Brunnthal-Nord, Germany, which is the real party in interest.

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RELATED APPEALS AND INTERFERENCES

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To the best of the knowledge and belief of the undersigned, no other appeals or interferences are or have been filed that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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STATUS OF THE CLAIMS

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This application was submitted on November 13, 2001, with claims 1-99. The following shows the current status of the claims.

1-22. Canceled.

23-29. Rejected.

30-73. Canceled.

74-75. Rejected.

76-99. Canceled.

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STATUS OF AMENDMENTS

There have been no amendments filed in this application subsequent to final rejection.

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SUMMARY OF CLAIMED SUBJECT MATTER

The invention is a system 10, 20 for supplying a consumer with electrical power. The system includes a fuel cell device 11, 21, a fuel tank device 12, 22, and a pump device 14, 24 provided on the consumer side. The fuel cell device generates electrical power. The fuel tank device houses fuel to be supplied to the fuel cell device. The pump device supports a supply of the fuel from the fuel tank device to the fuel cell device. The fuel cell device is provided on the consumer. The fuel tank device is a module that can be inserted into the consumer to supply power and can be removed from the consumer. The fuel is supplied essentially by the pump device.

The reference numerals in the summary indicate elements shown in the exemplary embodiments of Figs. 1 and 2, which show the claimed invention. A complete description of these embodiments is found in the written description in the passage spanning page 16, line 32 through page 20, line 5. The claims also recite aspects of other embodiments disclosed in the written description.

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GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 23-29, 74, and 75 are unpatentable under 35 USC §103(a) over
Lessing et al. (U.S. Patent 5,641,585), in view of Kelly et al. (U.S. Patent 6,268,077),
Gamo et al. (U.S. Patent 5,976,725), or Jankowski et al. (U.S. Patent 6,638,654).

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ARGUMENT

Summary

The claims recite a system for supplying a consumer with electrical power that includes a modular fuel tank device that can be inserted into the consumer to supply power and removed from the consumer, for example, for replacement or refilling. Lessing et al. do not disclose or suggest a modular, replaceable fuel tank, do not provide support for such a fuel tank, and do not acknowledge the advantage provided by such a fuel tank. Kelly et al., Gamo et al., and Jankowski et al. disclose fuel cell devices that include removable fuel tank components. However, the teachings of these secondary references are not compatible with the teachings of Lessing et al., so as to provide the system of the claimed invention.

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Rejection under 35 USC §103(a) over Lessing et al. (U.S. Patent 5,641,585)

Claim 23

The Claimed Invention

Independent claim 23 recites a system for supplying a consumer with electrical power. The system includes a fuel cell device, a fuel tank device, and a pump device provided on the consumer side. The fuel cell device generates electrical power. The fuel tank device houses fuel to be supplied to the fuel cell device. The pump device supports a supply of the fuel from the fuel tank device to the fuel cell device. The fuel cell device is provided on the consumer. The fuel tank device is a module that can be inserted into the consumer to supply power and can be removed from the consumer. The fuel is supplied essentially by the pump device.

The Examiner's Position

Lessing et al. teach a miniature ceramic fuel cell that is supported on a consumer device such as a mobile telephone. Both the fuel and ambient air are pumped to the fuel cell using pumps. The fuel is contained in a tank that is mounted on the consumer. Lessing et al. do not explicitly teach that the fuel tank is a module that can be inserted into the consumer. However, the invention would have been obvious to one of skill in the art, who would have been motivated to use a removable fuel tank in the Lessing et al. system. It is apparent that the Lessing et al. fuel tank contains a fixed volume of fuel. When the fuel tank is depleted, it would be expedient to be able to replace the fuel tank,

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and therefore one of skill in the art would have motivation to use a removable fuel tank. Further, it has been held that making integrally-connected elements separable from each other is generally not sufficient to distinguish a claim over the prior art. *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349, (CCPA 1961); MPEP 2144.04. Kelly et al., Gamo et al., and Jankowski et al. disclose removable fuel tanks in the art of portable fuel cell systems, and the artisan would be sufficiently skilled to use any of the technologies disclosed in the references for making the Lessing et al. fuel tank removable.

Appellant's Position

In contrast to the claimed invention, Lessing et al. disclose a miniature ceramic fuel cell in which the fuel tank is fixed in place, that is, the fuel tank is not a module that can be inserted into and removed from the consumer. As shown in Fig. 1, the fuel tank 18 is fixed in place with respect to the rest of the power supply system 10 and the consumer (cell phone) 14. Lessing et al. do not disclose or suggest that the fuel tank 18 is a module that is adapted to be inserted into and removed from the consumer 14, as recited in claim 23. Other embodiments of the Lessing et al. fuel cell are shown and described in the reference; none of these embodiments includes a removable fuel tank, and Lessing et al. do not suggest providing a removable fuel tank. In fact, Lessing discloses that the housing of the cell phone completely encloses the components of the power supply, without suggesting that the fuel tank 18 is accessible for removal or replacement. Column 4, lines 37-41.

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The examiner acknowledged that the cited reference does not expressly teach that the fuel tank is a module that can be inserted into the consumer, as recited in claim 23. However, the examiner asserted that it would have been obvious to one of ordinary skill in the art to include an insertable fuel tank in the Lessing et al. device because the artisan would be motivated to do so because it would be expedient to be able to replace the fuel tank when depleted. The examiner also cited three secondary references, namely, Kelly et al., Gamo et al., and Jankowski et al., as disclosing fuel cell devices that include removable fuel tanks. The examiner further asserted that making integrally-connected elements separable from each other is generally not sufficient to distinguish a claim over the prior art.

To establish a *prima facie* case of obviousness as asserted by the examiner, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. MPEP 2143.

Thus, it is respectfully pointed out that recognition by the examiner of a shortcoming of the conventional art that would be solved by an element of the claimed invention does not substitute for disclosing or suggesting that element by Lessing et al. in order to render the claim obvious; the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir.

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1991). It is improper to use hindsight to reject the claim after determining that the Lessing et al. device could be improved by an innovation of the claimed invention, when Lessing et al. themselves did not recognize the shortcoming or suggest the innovation. "In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Further, it is not only the case that Lessing et al. do not indicate that the fuel tank can be exchangeable; Lessing et al. also explicitly exclude an exchangeable fuel tank. With reference to Fig. 1, at column 4, lines 37-41, Lessing et al. state that "[t]he housing surrounding power supply system 10 is depicted as being open so as to reveal the components therein, although in actual use the housing would completely enclose the components of power supply." This enclosure would preclude the use of an exchangeable fuel tank, and thus Lessing et al. teach away from the claimed feature.

Where the court in *In re Dulberg* would not recognize that separability of elements would necessarily be a patentable feature, clearly such a feature would have patentable weight if that feature proved useful to one of skill in the art, such as to overcome a deficiency in the prior art. It is submitted that making integrally-connected elements separable from each other in this case is an inventive step, and not a mere design choice. In his rejection, the examiner recognized the utility of a modular, replaceable fuel tank. Many difficulties are encountered in providing such a replaceable

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fuel tank, none of which was addressed by Lessing et al. For example, any useful fuel for fuel cells inherently has dangerous properties. Among these are flammability (a property, for example, of hydrogen, methanol, butane), the ability to form explosive mixtures easily with air (hydrogen), and toxicity of the fuel (for example, methanol). As a result, an exchangeable fuel tank module that is to be handled by a consumer, which must be transported by different means of transportation in commerce, requires overcoming enormous difficulties regarding matters of safety, regulatory compliance, and consumer protection.

Lessing et al. did not address these difficulties, and therefore did not contemplate or suggest a replaceable fuel tank, and it follows that Lessing et al. did not provide a suggestion to one of skill in the art to include a replaceable fuel tank in their design or how one might do so. Absent this suggestion, one of skill in the art might recognize on his or her own that a replaceable fuel tank would be beneficial, but would be left with the task of providing the replaceable fuel tank, and overcoming the noted difficulties. In order to avoid the noted difficulties, one of skill in the art would have to be satisfied with the concept proposed by Lessing et al., that is, a device having a fixed fuel tank.

An analogous example would be the fuel tank of an automobile. In this example, the fuel tank is typically fixed onboard the vehicle and can only be refueled using specially designated, professionally-built and serviced refueling stations. No one would fairly assert that one of skill in the art would find suggestion in the design of a conventional automobile that a replaceable fuel tank could easily be provided, even though one of skill in the art might believe that a replaceable fuel tank might provide

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some advantage. As in the case of the claimed invention, one of skill in the art could imagine that such a feature would be an improvement over the conventional design, but is not put in possession of the improvement by disclosure of the conventional design. Thus, the claimed invention, which features a functional replaceable fuel tank as part of the design, is inventive, just as it would take an inventive step to provide a replaceable fuel tank for an automobile.

Further, providing a fuel tank module that can be inserted and removed requires overcoming significant technical challenges regarding the mechanical design, including provision of a mechanical retention mechanism, an ejection mechanism, a leak-tight fluid connection mechanism, and, in some cases, electrical interfaces. None of these factors is addressed by Lessing et al., whereas the claimed invention provides a working design. In addition, an exchangeable fuel cartridge requires a special housing design that allows access to the exchangeable fuel tank module, for example, by means of a lid that can be opened. As noted above, this requirement is not only overlooked by Lessing et al., that reference also explicitly discloses a housing that completely encloses the components of the power supply, including the fuel tank.

Numerous other factors must be addressed when providing a replaceable fuel tank, none of which was addressed by Lessing et al., making the Lessing et al. design unsuitable for use with a replaceable fuel tank. For example:

1. A fuel level sensor is typically used in fixed tanks but typically cannot be used for replaceable tanks, and there are additional difficulties associated with mobile devices,

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which must work in any orientation. Lessing et al. do not address this, and would leave a user unable to determine whether the exchangeable fuel tank is empty.

2. Not every pump is self-priming, and fuel cell systems are typically destroyed when air replaces fuel. Lessing et al. provide no means to protect the fuel pump and the rest of the system from making contact with air.

3. Lessing et al. make no provision for gaining access to the empty fuel tank. Specially designed housing and replacement mechanisms need to be provided.

4. Lessing et al. make no provision for protecting uncovered interfaces against dirt, dust, misuse, etc.

5. Lessing et al. do not address disposal of the empty fuel tank, which will contain dangerous residual amounts of fuel, or for managing the waste streams associated with the large number of these devices that would be in use.

6. Lessing et al. provide no means for inserting the new tank module, or for the device to determine or provide an indication that a full tank module has been inserted.

7. Other questions that are not addressed or answered by Lessing et al. include:

- Where do you get a new tank module?
- How do you transport the new tank module in light of the dangerous properties of any fuel?
- How is the dealer/retailer supplied with such tank modules?
- Is he/she allowed to store useful quantities?
- Are all regulations met?

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-How do you make sure that the fuel cartridge and system are compatible to avoid unauthorized fuel cartridges to be coupled to the fuel cell system?

These questions and the factors noted above clearly highlight that one of skill in the art would not be able to use an exchangeable fuel tank with the Lessing et al. device absent a great deal of experimentation and modification rising to the level of inventive effort. While one of skill in the art might recognize that such improvement over the Lessing et al. design would be beneficial, and might be internally motivated by that potential benefit, Lessing et al. do not supply even the suggestion for such inventive effort, and the examiner has not provided the teaching necessary to take that inventive step.

The examiner did cite secondary references as representing the state of the art, and as disclosing removable fuel tanks. For example, Kelly et al. disclose a portable fuel cell power supply having a fuel storage means 110 coupled to a regulator or fuel delivery means 120 by a miniature quick disconnect 130. Gamo et al. disclose a fuel cell system that includes a replaceable hydrogen occlusion alloy container 2 connected to a fuel cell 1 through a pressure regulator 5. Jankowski et al. discloses that a MEMS-based fuel cell can include a modular fuel reservoir cartridge that can be replaced.

However, the noted references do not disclose fuel cells or fuel tanks that are compatible with the teachings of Lessing et al. That is, none of the noted references overcomes the deficiencies of Lessing et al. noted above, nor do the references or the examiner disclose how the teachings of these additional references can be applied to the teachings of Lessing et al. such that the Lessing et al. fuel tank could be made removable

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and replaceable. Obviousness does not require absolute predictability with regard to success in the combination of teachings of references, but at least some degree of predictability is required. That is, at least some evidence of a reasonable expectation of success is needed to support a conclusion of obviousness. *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). There is no teaching or suggestion in the cited references that would enable one of skill in the art to modify the Lessing et al. miniature ceramic fuel cell to accept a removable fuel tank such as those disclosed by Kelly et al., Gamo et al., or Jankowski et al. Further, the examiner did not assert any such teaching or suggestion, nor did the examiner provide any evidence of a reasonable expectation of success that such combination would be feasible.

For at least the reasons noted above, withdrawal of the rejection is respectfully requested.

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Claim 24**The Claimed Invention**

Claim 24 recites the system of claim 23, in which the pump device can be adjusted such that a quantity of fuel supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as output quantity.

The Examiner's Position

The Lessing et al. pumps are capable of being controlled in the claimed manner.

Appellant's Position

Lessing et al. do not disclose or suggest this feature, and the examiner did not cite a passage in which this feature is disclosed or offer any specific example by which Lessing et al. render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. In addition, the argument with respect to claim 23 is incorporated herein in its entirety as being applicable to claim 24, which depends from claim 23. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 25

The Claimed Invention

Claim 25 recites the system of claim 23, in which the fuel cell device is designed as a hydrogen fuel cell device.

The Examiner's Position

The Lessing et al. fuel cell is operable on hydrogen.

Appellant's Position

The argument with respect to claim 23 is incorporated herein in its entirety as being applicable to claim 25, which depends from claim 23. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 26**The Claimed Invention**

Claim 26 recites the system of claim 23, further comprising a pump device provided on the consumer side, for supporting a supply of the oxidising agent to the fuel cell device.

The Examiner's Position

The examiner did not specifically address this claim, and did not express a particular position or argument with respect to this claim.

Appellant's Position

It is not clear whether Lessing et al. provide or suggest a pump device on the consumer side, and the examiner and the examiner did not cite a passage in which this feature is disclosed or offer a specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. In addition, the argument with respect to claim 23 is incorporated herein in its entirety as being applicable to claim 26, which depends from claim 23. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 27

The Claimed Invention

Claim 27 recites the system of claim 26, in which the supply of the oxidising agent is essentially supplied by the pump device.

The Examiner's Position

The examiner did not specifically address this claim, and did not express a particular position with respect to this claim.

Appellant's Position

It is not clear whether Lessing et al. provide or suggest an oxidizing agent by a pump device on the consumer side, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. In addition, the arguments with respect to claims 23 and 26 are incorporated herein in their entireties as being applicable to claim 27, which depends from claims 23 and 26. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 28**The Claimed Invention**

Claim 28 recites the system of claim 26, in which the pump device can be adjusted such that the quantity of oxidising agent supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as an output quantity.

The Examiner's Position

The Lessing et al. pumps are capable of being controlled in the claimed manner.

Appellant's Position

Lessing et al. do not disclose or suggest the pump adjustment feature, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. Further, it is not clear whether Lessing et al. provide or suggest a pump device on the consumer side, as recited in claim 26, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. In addition, the arguments with respect to claims 23 and 26 are incorporated herein in their entireties as being applicable to claim 27, which depends from claims 23 and 26. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 29

The Claimed Invention

Claim 29 recites the system of claim 26, in which the pump device is designed as a ventilator device for supplying atmospheric air from the environment.

The Examiner's Position

The examiner did not specifically address this claim, and did not express a particular position with respect to this claim.

Appellant's Position

Lessing et al. do not disclose or suggest a pump that is designed as a ventilator device, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. Further, it is not clear whether Lessing et al. provide or suggest a pump device on the consumer side, as recited in claim 26, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature. In addition, the arguments with respect to claims 23 and 26 are incorporated herein in their entireties as being applicable to claim 27, which depends from claims 23 and 26. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 74**The Claimed Invention**

Claim 74 recites the system of claim 23, in which the pump device can be adjusted such that a quantity of fuel supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as output quantity.

The Examiner's Position

The Lessing et al. pumps are capable of being controlled in the claimed manner.

Appellant's Position

Lessing et al. do not disclose or suggest this feature, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. In addition, the argument with respect to claim 23 is incorporated herein in its entirety as being applicable to claim 74, which depends from claim 23. Withdrawal of the rejection, therefore, is respectfully requested.

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Claim 75**The Claimed Invention**

Claim 75 recites the system of claim 27, in which the pump device can be adjusted such that the quantity of oxidising agent supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as an output quantity.

The Examiner's Position

The Lessing et al. pumps are capable of being controlled in the claimed manner.

Appellant's Position

Lessing et al. do not disclose or suggest this feature, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature or render obvious the claimed feature. Further, the examiner did not assert that the secondary references disclose or suggest this feature. Further, it is not clear whether Lessing et al. provide or suggest an oxidizing agent by a pump device on the consumer side, as recited in claim 27, and the examiner offers no specific example by which Lessing et al. disclose or suggest this feature. In addition, the arguments with respect to claims 23, 26, and 27 are incorporated herein in their entireties as being applicable to claim 75, which depends from claims 23, 26, and 27. Withdrawal of the rejection, therefore, is respectfully requested.

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Based on the foregoing, it is submitted that all rejections have been overcome. It is therefore requested that the Amendment be entered, the claims allowed, and the case passed to issue.

The fee for this appeal brief was previously paid with submission of the original appeal brief on April 24, 2006. Because a final Board decision has not been made on the prior appeal, please apply the previously-paid appeal brief fee to this appeal brief. If any fees are deficient, please charge any deficiency to our deposit account, No. 501998, and notify us accordingly.

Respectfully submitted,

September 28, 2006
Date

TMC:hlp


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APPENDIX ACLAIMS

23. A system for supplying a consumer with electrical power, comprising:
a fuel cell device for generating electrical power,
a fuel tank device for housing fuel to be supplied to the fuel cell device, and
a pump device provided on the consumer side, for supporting a supply of the fuel
from the fuel tank device to the fuel cell device,

characterised in that the fuel cell device is provided on the consumer and the fuel
tank device is a module that can be inserted into the consumer to supply power and
removed from the consumer,

wherein the fuel is supplied essentially by the pump device.

24. A system as claimed in Claim 23, in which the pump device can be
adjusted such that a quantity of fuel supplied by the pump device of the fuel cell device
effects a constant output of the fuel cell device, such that the output of the fuel cell device
serves as output quantity.

25. A system as claimed in Claim 23, in which the fuel cell device is designed
as a hydrogen fuel cell device.

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26. A system as claimed in Claim 23, further comprising a pump device provided on the consumer side, for supporting a supply of the oxidising agent to the fuel cell device.

27. A system as claimed in Claim 26, in which the supply of the oxidising agent is essentially supplied by the pump device.

28. A system as claimed in Claim 26, in which the pump device can be adjusted such that the quantity of oxidising agent supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as an output quantity.

29. A system as claimed in Claim 26, in which the pump device is designed as a ventilator device for supplying atmospheric air from the environment.

74. A system as claimed in Claim 23, in which the pump device can be adjusted such that a quantity of fuel supplied by the pump device of the fuel cell device effects a constant output of the fuel cell device, such that the output of the fuel cell device serves as output quantity.

75. A system as claimed in Claim 27, in which the pump device can be adjusted such that the quantity of oxidising agent supplied by the pump device of the fuel

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cell device effects a constant output of the fuel cell device, such that the output of the fuel
cell device serves as an output quantity.

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APPENDIX B

EVIDENCE

None.

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APPENDIX C

RELATED PROCEEDINGS

None.